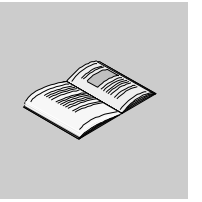
PL7DIF User Manual

eng

Table of Contents



About the Book 5

Part I General information on the PL7DIF software 7
At a Glance 7

Chapter 1 Introduction to PL7DIF 9
General Points. 9

Chapter 2 Installing PL7DIF. 11
At a Glance 11
How to set up the software 12
How to register PL7 DIF 13
How to Transfer PL7 DIF User Rights from One Workstation to Another 15

Chapter 3 Limitations of the product PL7DIF 17
Limitations 17

Part II Interactive mode of usage 19
At a Glance 19

Chapter 4 Interactive mode 21
How to run PL7DIF in interactive mode. 21

Chapter 5 Comparing two applications 23
How to compare two applications 23

Chapter 6 Displaying the results 25
At a Glance 25
Identifying the application 26
Application browser. 28
Analyzing the differences 30
Visual comparison method 31

Chapter 7 Printing a comparison file 37
How to print a comparison folder. 37

Chapter 8 Creating a comparison file 39
How to create a comparison file. 39

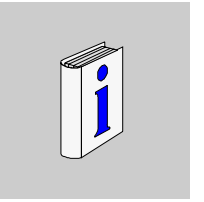
Part III Batch usage mode 41
At a Glance 41

Chapter 9 Batch mode 43
General description of batch mode 43

Chapter 10 Starting "batch" on a keyboard 45
How to start a "batch" on the keyboard 45

Chapter 11 Starting a programmed "batch" 47
How to program a "batch" 47

About the Book



At a Glance

Document Scope This manual describes the installation and use of the PL7DIF software.

User Comments We welcome your comments about this document. You can reach us by e-mail at TECHCOMM@modicon.com

General information on the PL7DIF software

I

At a Glance

Aim

This Part provides general information on the PL7DIF software.

What's in this Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
1	Introduction to PL7DIF	9
2	Installing PL7DIF	11
3	Limitations of the product PL7DIF	17

Introduction to PL7DIF

1

General Points

Function

The PL7DIF software can be used to compare two PL7 multi-PLC applications (in .STX format) for Micro and Premium PLCs: TSX, PCX and PMX, then view the results.

Domain of application

The comparison is made on all types of PL7 V4.x application, of version levels less than or equal to the installed PL7 PRO V4.x version.

Equipped station	Level of applications compared
PL7 DIF V4.2 and PL7 PRO V4.2	V4.0 V4.1 V4.2
PL7 DIF V4.2 and PL7 PRO V4.3	V4.0 V4.2 V4.1 V4.3
PL7 DIF V4.2 and PL7 PRO V4.4	V4.0 V4.2 V4.4 V4.1 V4.3

If the application does not respect this rule, a warning message appears. This message reads `PL7 access impossible. Comparison stopped. Incorrect file format. Reopen and resave the application using PL7 to ensure correct compatibility.`

Update procedure

To update your application:

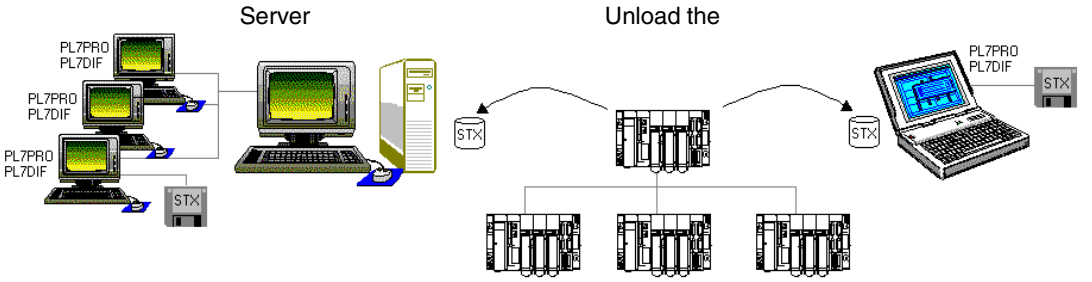
Step	Action
1	open your application with the most recent version of PL7 PRO installed on your station
2	Click "YES" when asked if you want to update the input/output catalog
3	Save the application

Limitations

PL7DIF cannot be used to write or modify PL7 applications.
PL7DIF cannot compare applications stored in the PLC (you must first download the PLC applications:

- either using the PL7PRO workshop,
- or using a client application of the PL7 OLE Automation Server.

PL7DIF environment



Description of the necessary environment

In order for PL7DIF to operate correctly, the PC must be configured as follows:

- Pentium type processor or above,
- minimum 64 Mb of RAM,
- PL7 Pro software version V4.0 or later.

Installing PL7DIF

2

At a Glance

Aim of this Chapter

Full installation of P17Diff includes:

- software installation
- present documentation
- two complete copies displaying the advantages of the batch mode (this mode is described in Part III)
- and a README type file to assist with the installation of its various elements.

These examples, which are complete with their source code and available to you, correspond to:

- a DOS type command file, which implicitly starts PL7DIF,
- a Visual Basic 5.0 application
  - displaying all PL7DIF input pulses,
  - allowing the process for comparing different types to be configured
  - creating a command file, which is relative to the processes stated previously.

What's in this Chapter?

This chapter contains the following topics:

Topic	Page
How to set up the software	12
How to register PL7 DIF	13
How to Transfer PL7 DIF User Rights from One Workstation to Another	15

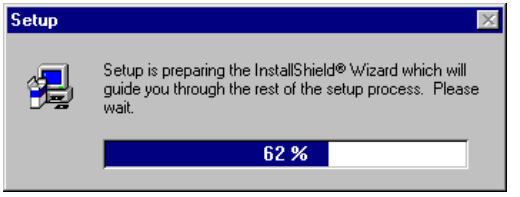
How to set up the software

Introduction

In order to set up PL7DIF, it is first necessary to correctly install PL7 PRO (SV 4.0) (compliance with the system registry, i.e. PL7PRO must be saved as OLE server).

Procedure

This table shows the procedure for setting up the software.

Step	Action
1	Insert the compact disc into the correct drive. **Note:** if the drive is set to automatic startup, proceed to step 5.
2	Click on the **Start** button.
3	Select the **Execute** command.
4	Enter the CD-ROM or DVD drive identifier (for example E), Using the root, select directory PL7DIF_V42, Type "\setup" then validate with OK **Result:** The following window is displayed: 
5	Validate the following two windows in order to save your name and organization, and the setup language (French or English). **Note:** The default program group is "Modicon Télémécanique"
6	Validate to complete the installation.

The installation is temporary (activation duration = **21** days). The following chapter, entitled "PL7DIF protection", explains the procedure for making this installation permanent.

Recommendations

In order to operate correctly, PL7DIF must be reinstalled every time the PL7 PRO software is updated.

Reinstallation procedure

This table shows the procedure for setting up the software.

Step	Action
1	Run "Setup.exe" to uninstall PL7DIF.
2	Update the PL7 PRO software.
3	Run PL7DIF again to reinstall it

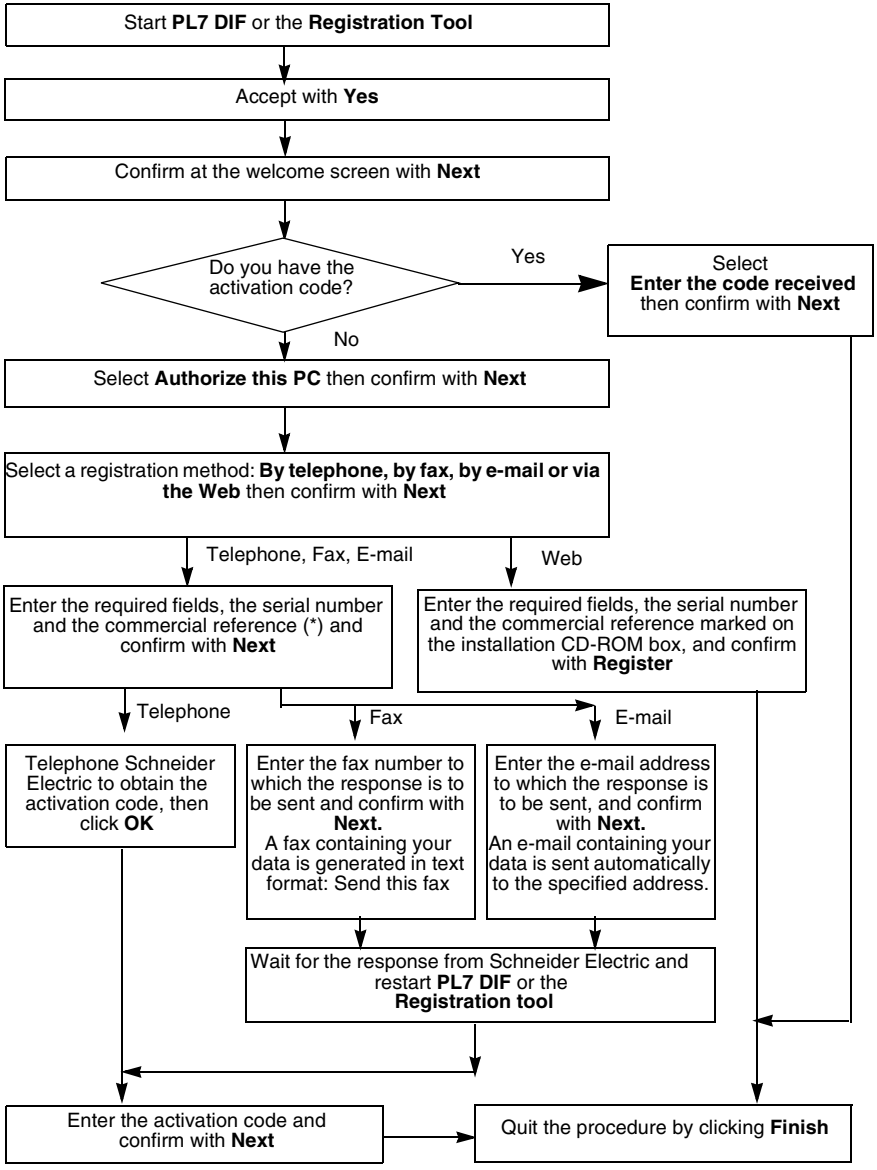
How to register PL7 DIF

At a Glance

To obtain permanent user rights for the software, you must register it with Schneider Electric. Once the software is installed, you have 21 days to register.

Procedure

This procedure describes the different steps in registering PL7 DIF.


Start **PL7 DIF** or the **Registration Tool**
Accept with **Yes**
Confirm at the welcome screen with **Next**
Do you have the activation code?
Yes
Select **Enter the code received** then confirm with **Next**
No
Select **Authorize this PC** then confirm with **Next**
Select a registration method: **By telephone, by fax, by e-mail or via the Web** then confirm with **Next**
Telephone, Fax, E-mail
Web
Enter the required fields, the serial number and the commercial reference (*) and confirm with **Next**
Enter the required fields, the serial number and the commercial reference marked on the installation CD-ROM box, and confirm with **Register**
Telephone
Fax
E-mail
Telephone Schneider Electric to obtain the activation code, then click **OK**
Enter the fax number to which the response is to be sent and confirm with **Next.** A fax containing your data is generated in text format: Send this fax
Enter the e-mail address to which the response is to be sent, and confirm with **Next.** An e-mail containing your data is sent automatically to the specified address.
Wait for the response from Schneider Electric and restart **PL7 DIF** or the **Registration tool**
Enter the activation code and confirm with **Next**
Quit the procedure by clicking **Finish**

(*) These numbers are marked on the label inside the box containing the software CD-ROMs.

How to Transfer PL7 DIF User Rights from One Workstation to Another

Introduction

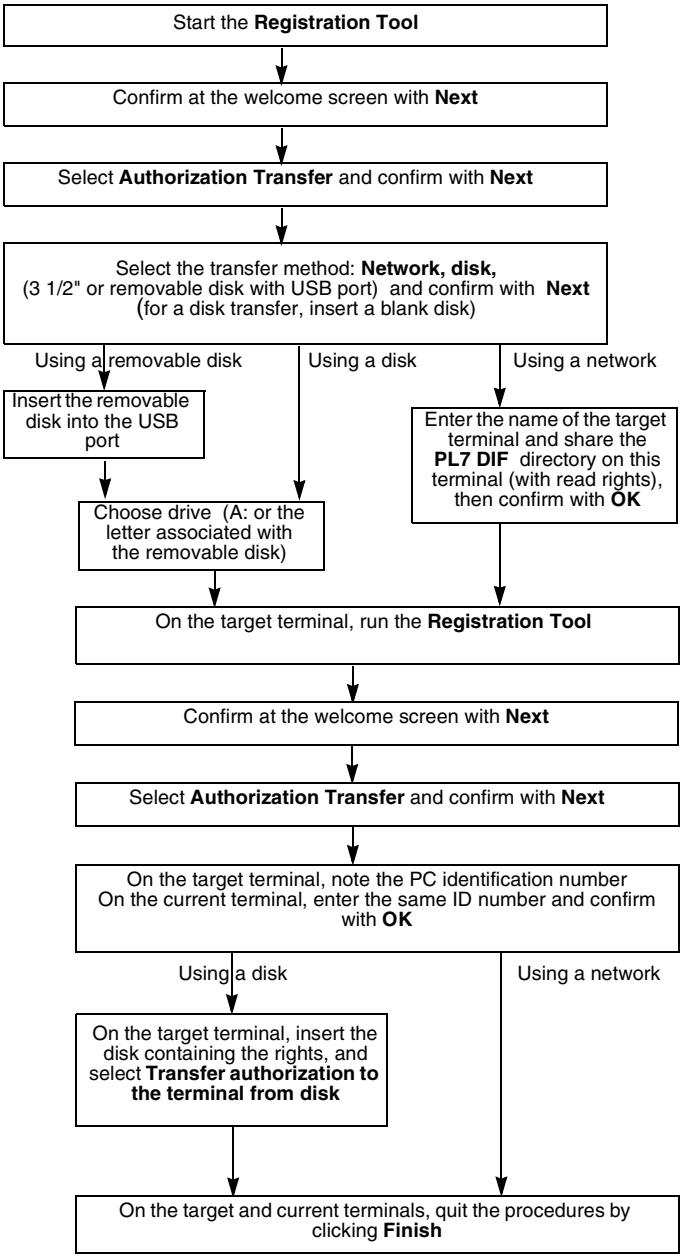
This function is used to transfer user rights from a source terminal to a new terminal (destination), thus enabling PL7 DIF to be launched on it.
The transfer can be carried out using:

- A 3 1/2" floppy disk,
- A network.

Note: Once the access rights have been transferred, the source terminal can no longer use PL7 DIF unless you save again or make a reverse transfer.
Following transfer of the rights to floppy or removable disk, if these rights are altered before being transferred to the destination terminal, contact Schneider Electric for a new registration.

How to Perform a Transfer

This procedure describes the different steps for transferring user rights.


Start the **Registration Tool**
Confirm at the welcome screen with **Next**
Select **Authorization Transfer** and confirm with **Next**
Select the transfer method: **Network, disk,** (3 1/2" or removable disk with USB port) and confirm with **Next** (for a disk transfer, insert a blank disk)
Using a removable disk
Using a disk
Using a network
Insert the removable disk into the USB port
Enter the name of the target terminal and share the **PL7 DIF** directory on this terminal (with read rights), then confirm with **OK**
Choose drive (A: or the letter associated with the removable disk)
On the target terminal, run the **Registration Tool**
Confirm at the welcome screen with **Next**
Select **Authorization Transfer** and confirm with **Next**
On the target terminal, note the PC identification number
On the current terminal, enter the same ID number and confirm with **OK**
Using a disk
Using a network
On the target terminal, insert the disk containing the rights, and select **Transfer authorization to the terminal from disk**
On the target and current terminals, quit the procedures by clicking **Finish**

Limitations of the product PL7DIF

3

Limitations

Introduction

The software PL7DIF has some limitations when operating comparaison of application coming from PL7. There are different types of limitations. They are classified in the table below.

Details on limitations

The following table describes those limitations:

Components of a PL7 application	Description
Overview	This version of PL7 does not allow to process an application located on several diskettes **Palliative:** Re-generate this application on the PC drive or on a network drive
Hardware configuration	PL7 does not detect if there is or not any memory protection of a CPU card
Program	• When a program element in LADDER or GRAFCET has a name including special characters (such as é, è, à...), this section cannot be opened in PL7 **Palliative:** It is possible to open it through PL7PRO. • When a program element is write-protected, PL7DIF cannot do any protection on this element. It is not accessible. • When an element of a program has a diagnostic option in its station properties, PL7DIF cannot do any difference on this element.
Micro Application	**PL7DIF** can exclusively be applied to Micro applications **written** with the software PL7 Pro 4.0 and later.

Interactive mode of usage

II

At a Glance

Aim

This Part introduces the man-machine interface of this mode and describes how to carry out a comparison.

What's in this Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
4	Interactive mode	21
5	Comparing two applications	23
6	Displaying the results	25
7	Printing a comparison file	37
8	Creating a comparison file	39

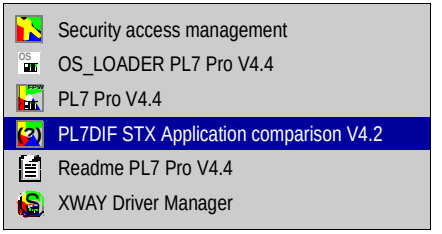
Interactive mode

4

How to run PL7DIF in interactive mode

Procedure

The following table describes the procedure for running PL7DIF in interactive mode:

Step	Action
1	Click on the **Start** button.
2	Select the **Programs** command, then the **Modicon Telemecanique** group.
3	Double-click on "PL7DIF"  **Note:** The program is then loaded. It ends when the main PL7DIF window appears.

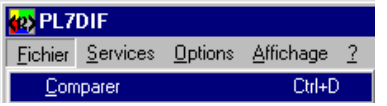
Comparing two applications

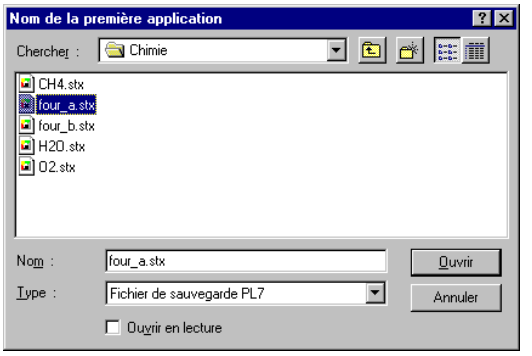
5

How to compare two applications

Procedure

The following table describes the procedure for a comparison:

Step	Action
1	Click on **Compare** or select the **Compare** option in the **File** menu 

Step	Action
2	Then select the first and second applications using the selection windows:  **Reminder:** PL7DIF compares two applications that are accessible on IT supports (network or internal disk, CD, DVD, floppy disk) and in .STX form. **Note:** When the comparison is complete, the application browser appears. **Result:** the differences are accessible via a three-tab folder: ● Presentation of the two applications' differences in identity: ● Detailed presentation of the two applications' program differences: ● Presentation of the differences for compiling a folder or saving in text file format:

Information

By default, the comparison is made in the ascending chronological order in which the two STX applications were saved.
Application 1 is the oldest, application 2 is the most recent.
Order of comparison:

Step	Action
1	Select or deselect the **Compare by date** option in the **Options** menu. Deselecting this option enables you to keep the comparison order defined by the user. **Note:** This option is kept as long as the user makes no change.

Displaying the results

6

At a Glance

Aim of this Chapter

Presentation and processing of results

What's in this Chapter?

This chapter contains the following topics:

Topic	Page
Identifying the application	26
Application browser	28
Analyzing the differences	30
Visual comparison method	31

Identifying the application

Description

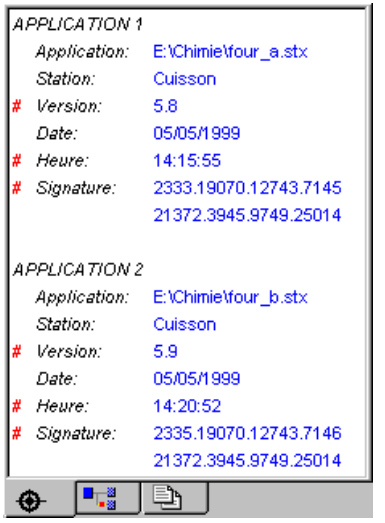
Presentation of information of the two applications. The differences are indicated by a #.

Access

At the end of the comparison, the application characteristics are compared.
The identification tab is:

Illustration

Example of how the results are presented:



Information

Description of the collected information:

Address	Details
Application	Disk\path\file name
Station	Name of the station defined in PL7
Version	Application version
Date	Date the file was saved
Time	Time the file was saved
Application identification	Identifier of downloaded information on the PLC. Made up of 8 digital information units, which have the following purpose: ● station identification ● application identification related to the local I/O configuration ● application identification related to the remote I/O configuration ● application identification related to the PL7 code ● application identification related to the grafcet ● application identification related to the constants ● application identification related to the symbols ● application identification related to the reservation

Application browser

Description

The browser gives the structure of the two applications. The blocks that show the differences are indicated using #.

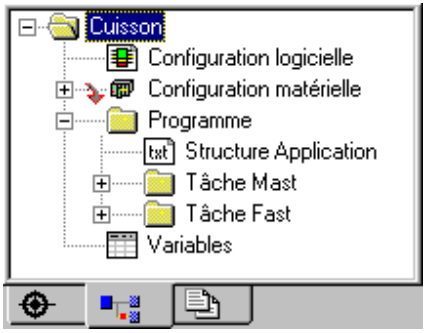
Access

At the end of the comparison, a detailed description of the differences is presented. The browser tab is:

It is necessary to open the directory tree by clicking on the '+' to display the blocks containing the differences.

Illustration

Application browser:



Information

The information associated with application 1 is given in blue; application 2 information is given in red.
Meanings of the various symbols:

Symbol	Meaning
	The part contains one or more differences, which can be displayed by opening it. It is only when a symbol is present that the directory tree must be opened.
	This block contains one or more differences.
	This section is only found in application 1.
	This section is only found in application 2.
	The programming language of this section is different in the two applications.

Analyzing the differences

Description

Detailed presentation of the difference(s) of one block.

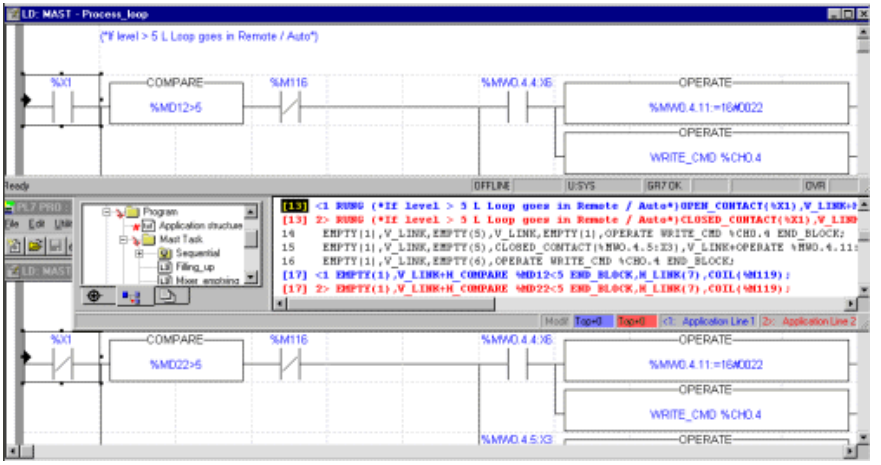
Access

If you select a difference in the browser, PL7DIF will display the details of:

- the P17 graphics editor and extracts of the source files for hardware configuration, and the sections programmed in ladder or Grafcet.
- extracts of the application's source code file in other cases

Illustration

Display of the details.



Visual comparison method

Procedure

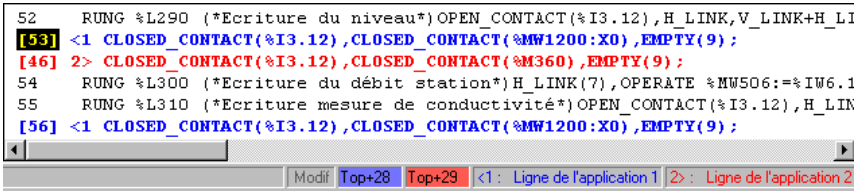
This table describes the procedure for performing a visual comparison:

Step	Action
1	Run the comparison
2	Localize the blocks featuring the differences with the application browser.
3	Select a difference.
4	Analyze the differences using the application source extracts and PL7 graphical editors opened automatically by PL7DIF
5	It is also possible to display only the differences. Click on **Partial** or select the **Partial Display** item in the **Option** menu **Note:** This change in display mode may be made at any time. To return to the previous mode, click **Full** or select the **Full Display** item in the **Option** menu **Note:** This option is kept as long as the user makes no change. **Note:**The F7 and F8 keys can be used to switch from one difference to the other in the same block (see special case for Grafcet).

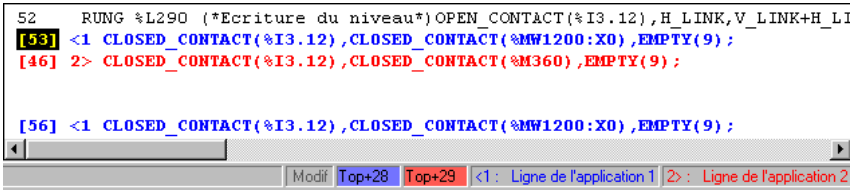
Information on full and partial display

This option concerns the display in the MDI window:

- **Full Display** displays all the text of the comparison. It also includes the identical blocks of the two applications.
  With this display mode, if there are any differences the status bar includes the position of the modification in the program section.
  Example:



- **Partial Display** displays only the differences. The successive differences are separated by a white line and preceded by the marker flag.
  Example:



- **Marking of the difference positioning**
  This unit includes three flags:
  - the type of difference **SUP** (delete), **INS** (insert), **MODIF** (modify)
  - its positioning in application 1
  - its positioning in application 2

It is adapted to the type of menu concerned.
Summary of the types of display:

Module	Partial display (in the text)	Full display (in the status bar)
List or Structured Text	Sequence: (Top+n°, Sup) Sequence: (Ins, Top+n°) Sequence: (Top+n°, Top+n°)	Sup Top+n° Ins Top+n° Modif Top+n° Top+n°
Ladder	Rung: (Top+n°, Sup) Rung: (Ins, Top+n°) Rung: (Top+n°, Top+n°)	Sup Top+n° Ins Top+n° Modif Top+n° Top+n°
Grafcet	(Sup in Page n°) (Ins in Page n°) (Modif in Page n°)	Sup Page n° Ins Page n° Modif Page n° Page n°

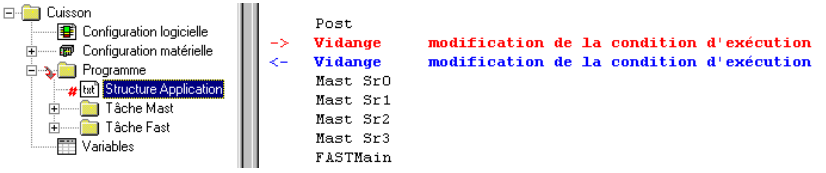
Difference in the software structure of the application

Only the source code extracts of the applications can be used to localize the differences.
For example, a different number of configured grafcet steps is indicated with:

```
[11] <! NB_ACTIVE_TIME = 128
[12] <! CHART (MAX_PAGES = 8 , MAX_STEP = 128)
[11] !> NB_ACTIVE_TIME = 160
[12] !> CHART (MAX_PAGES = 8 , MAX_STEP = 160)
```

Difference in a section validation condition

The difference in section validation condition is indicated at application structure level.
For example, in this cooking application, the drainage section condition had been modified:



Difference in the ladder section of the application

PI7DIF opens the respective Ladder sections of each application one-by-one (where these exist) in order to perform a visual check. Using the editors, analyze the differences in the rung(s) concerned.

Difference in the Grafcet section of the application

PL7DIF opens the Grafcet section of each application page-by-page (where these exist) in order to perform a visual check. Using the editors, analyze the differences in the page(s) concerned.

Note: The F7 and F8 keys can be used to go to the differences page-by-page. If a page includes several modifications, you need to search for these in the textual section or using the graphic editor.

Difference in the ST or IL section of the application

Only the source code extracts of the applications can be used to localize the differences.

Difference in DFB code

The analysis is made following the rules for the language used.

Difference in variables

Only the source code extracts of the applications can be used to localize the differences. The differences appear either at application structure level (software configuration), or at variable level. This particularly applies for constants or the configuration of predefined FB blocks.
The list of variables is broken down into two portions:

- It includes the modified (at symbol, comment level), deleted or inserted variables,
- In includes the variables that are unchanged between the two applications.

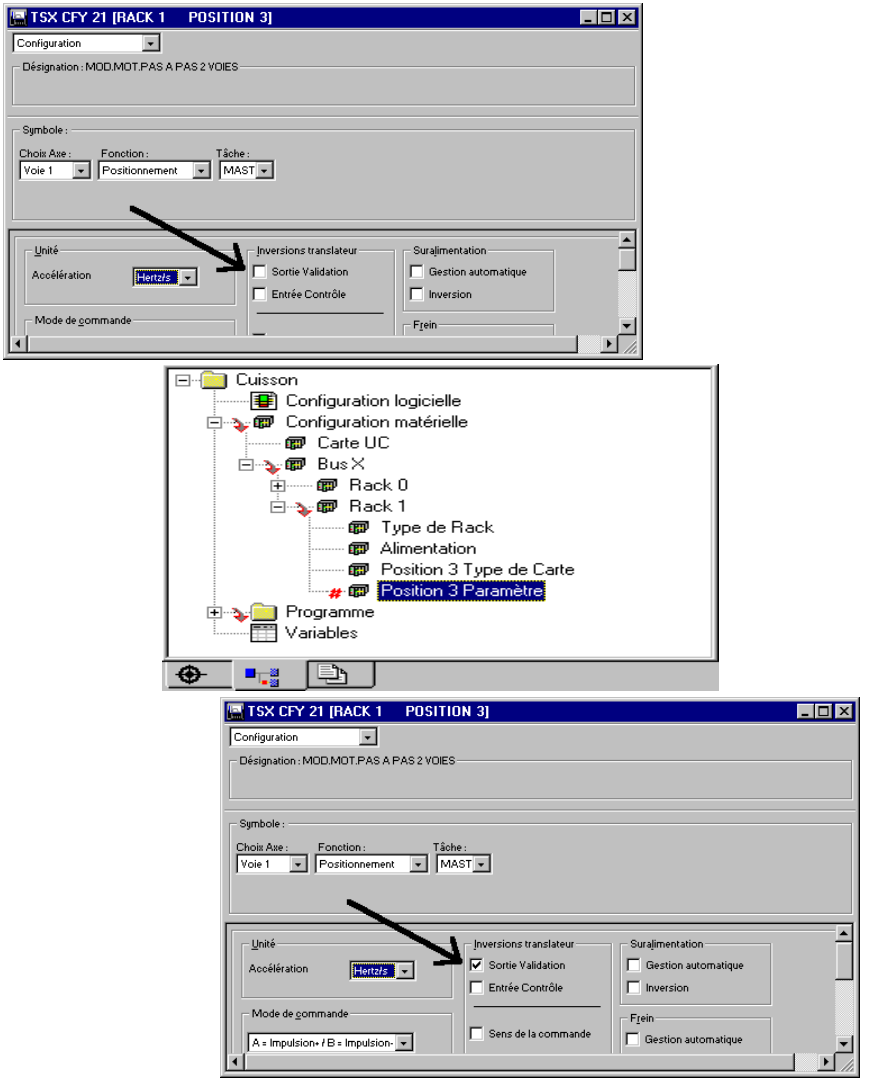
Note: In partial display, this second section is not present.

Difference between the functional modules

PI7DIF shows the differences for the functional modules but does not display the details

Difference in hardware configuration

PI7DIF opens the two PL7 editors for the visual check. The differences can then be identified.
In this example, the configuration of the TSX CFY 21 module located in position 3 of rack 1 is different.



Difference in application protection

A general difference in application protection is only indicated on application 1.

Printing a comparison file

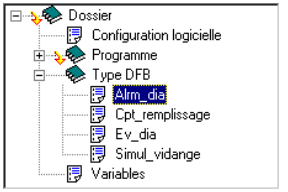
7

How to print a comparison folder

Description Printing a comparison folder is only possible from the folder sheet.

How to print

This table describes the procedure for printing:

Step	Action
1	Click the "folder" tab **Result:** the folder sheet appears.
2	Then select the blocks to include in the comparison folder:  The button is used to include the block in the comparison folder. The button is used to exclude the block from the comparison folder.
3	Compile the folder with the button
4	Launch the printing of the comparison folder by clicking or by clicking **Print** from the **File** menu.

Using the print-out

The comparison folder features a legend that explains the symbolization used to mark the differences.
The contents of the folder depends on whether the full display or partial display option is selected.
A portion of the program excluded from the folder is indicated on printing.

Creating a comparison file

8

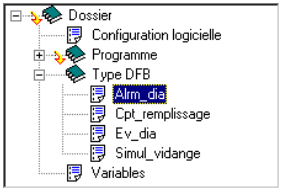
How to create a comparison file

Description

Creating a comparison file is only possible from the folder sheet.

How to create a comparison file

This table describes the procedure for creating a comparison file

Step	Action
1	Click the "folder" tab **Result:** The file sheet appears.
2	Then select the blocks to include in the comparison folder:  The button is used to include the block in the comparison folder. The button is used to exclude the block from the comparison folder.
3	Compile the folder with the button
4	Save the comparison file by clicking or by clicking **Save** from the **File** menu.

Operating the file

The comparison file is an ASCII-type text file. It can be displayed using an editor. It includes the contents of the target file and the main differences window.
This file features a legend that explains the symbolization used to mark the differences.
The contents of the file depends on whether the full display or partial display option is selected.
A portion of the program excluded from the file is indicated on printing.

Batch usage mode

III

At a Glance

Aim

This Part describes the advantages of this mode and the various programmed commands available.

What's in this Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
9	Batch mode	43
10	Starting "batch" on a keyboard	45
11	Starting a programmed "batch"	47

Batch mode

9

General description of batch mode

At a Glance

The software allows a "batch" operation to be launched directly using a command without an interactive window.
PL7DIF is started in "basic task" mode, with no display and no possibility of operator input.
This is the typical mode used, for example, to automate repetitive tasks or gain access to information on how to manage the STX application versions. More generally there is information on functional development on a higher level than PL7DIF, followed up with processes (maintenance management, labeling the causes of a regression for diagnostic purposes), which contain implementation details specific to the PL7DIF and PL7PRO.

Starting "batch" on a keyboard

10

How to start a "batch" on the keyboard

Procedure

This table describes the procedure for starting the "batch" on the keyboard:

Step	Action
1	Click on the **Start** button.
2	Select the **Execute** command
3	Locate the executable PL7Diff.exe using the **Browse** button
4	Type the PL7DIF call command

Syntax of the call command

The PL7DIF call command contains the following fields:

The command fields	Description
The first field contains: An indication of the type of process	-**d** or -**D** for display -**p** or -**P** for print -**s** or -**S** for save
The next field: The **pathfile1** of application 1	It is made up of the file path and name of this application, bound by the limits "and"
The next field: This is **optional** This allows the user to define his/her own version item for application 1	This is a chain of characters, which must be preceded by a limiter /
The next field: The **pathfile2** of application 2	It is made up of the file path and name of this application, bound by the limits "and"
The next field: This is **optional** This allows the user to define his/her own version item for application 2	This is a chain of characters, which must be preceded by a limiter /

The command fields	Description
The next field: This is **only present** if the process type is a **save**. It is the **pathfileresult**	It is made up of the file path and name of this application, bound by the limits "and"
The next field: This is **only present** if the process type is a **save**. It is the **pathfileresult**	It is made up of the file path and name of this application, bound by the limits "and"

Detail of the call command

The following table details this command:

If you want to ...	the command is ...	Result:	Performance	Example
Start PL7DIF to display	PL7DIF -**d** or -**D** "pathfile1" [/versionCML1] "pathfile2" [/versionCML2]	Opening the application browser	At the end of the command, PL7diff puts itself in interactive mode as previously described to allow visual intervention and analysis.	PL7DIF -**d** "c:\appli\four_a.stx" /009 "c:\appli\four_b.stx" /008
Start PL7DIF to print	PL7DIF -**p** or -**P** "pathfile1" [/versionCML1] "pathfile2" [/versionCML2]	Printing the differentiation file in text format, and closing PL7DIF	When the command has been given, PL7diff works in basic task mode and the end of the operation is indicated when the file prints out	PL7DIF -**P** "c:\appli\four_a.stx" "c:\appli\four_b.stx"
Start PL7DIF to save	PL7DIF -**s** or -**S** "pathfile1" [/versionCML1] "pathfile2" [/versionCML2] "pathfileresult" "pathfileerror"	Saving the differentiation file in text format, and closing PL7DIF	When the command has been given, PL7diff works in basic task mode and the end of the operation is indicated when a save file is created.	PL7DIF -**s** "c\appli\CPT1_o.stx" "c:\appli\CPT1.stx" /V2.d "c:\cml\diff.rpt" "c:\temp\diff.err"

Note: When PL7DIF is running the command, the user can carry out other tasks of any kind on the computer.

Note: The product name is PL7DIF, the executable name is PL7Diff.
If the operation is Print or Save, we recommend you create a PL7DIF client application (refer to the following chapter).

Starting a programmed "batch"

11

How to program a "batch"

Introduction

It is necessary to create a PL7DIF client application. You should be familiar with one of the following languages, especially to use the OLE automation mechanism and to deal with exceptions:

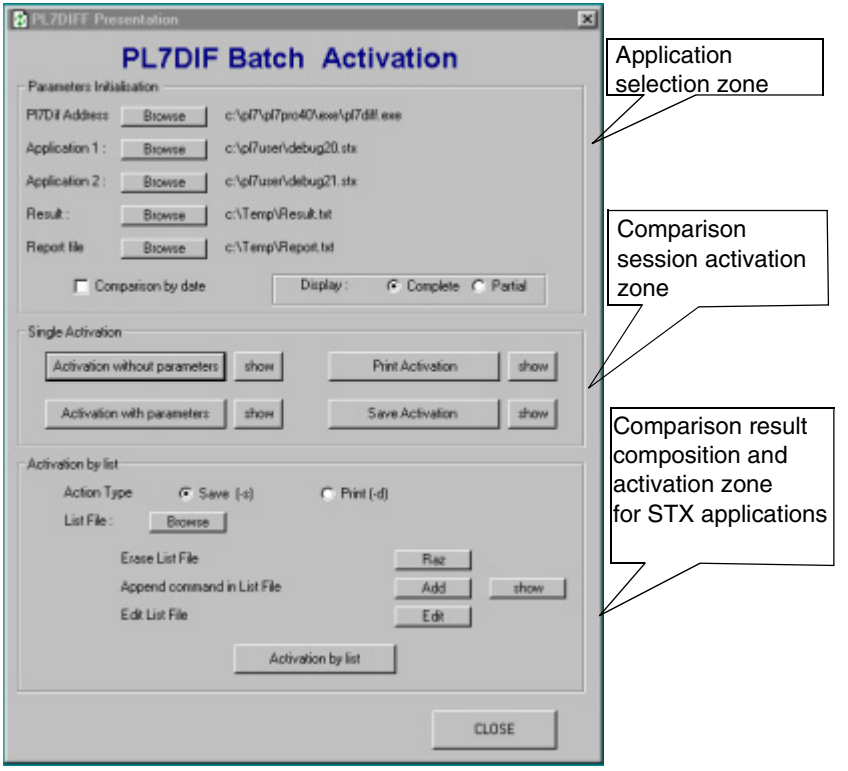
- Microsoft Visual Basic, version 5.0 or above,
- Microsoft Visual C++, version 4.2 or above.

Examples

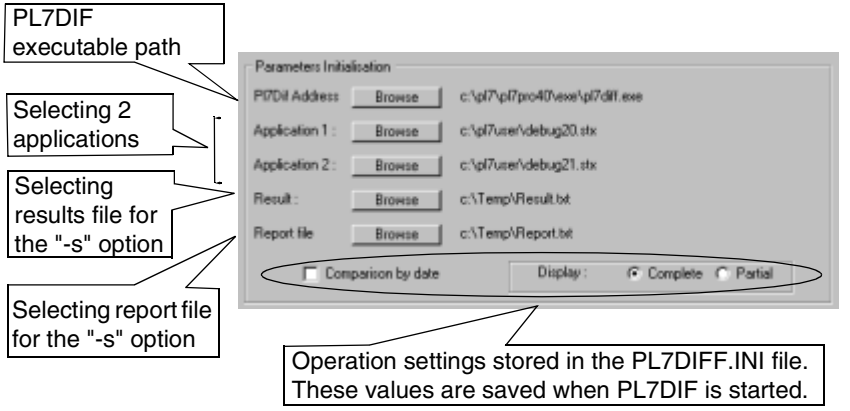
Two examples, supplied with the product, illustrate how to use this start:

- **First example**: This is a DOS type command file (suffix .bat) which illustrates:
  - how to create a call command for all process types,
  - and string the call commands.
- **Second example**: This is a PL7DIF client application, written in Microsoft Visual Basic, version 5.0, which allows:
  - the type of process (display, print, save) to be recorded
  - an application list file (configurable) to be generated in order to illustrate the repetition of STX application comparison tasks without any intervention from the operator. It starts PL7DIF in basic task mode successively on each application pair.

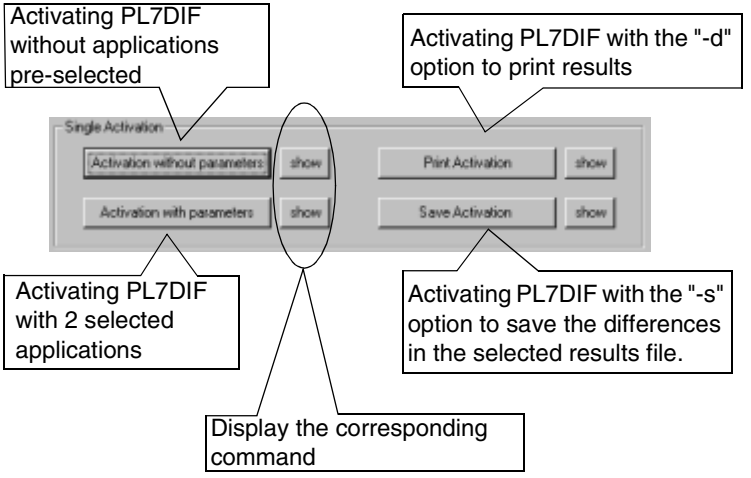
The different screens below show the operating rules:
Man-machine interface:



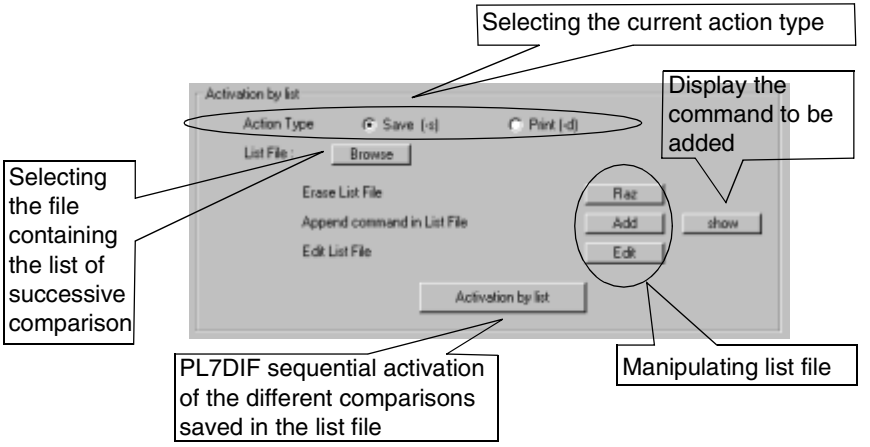
Initialization of the call command fields



Execution of a call command



Automatic stringing of a call command list



Note: This example is provided as an indication and must be adapted to your specific applications and your safety needs.

Information: It is possible, among other things, to add to this example:

- the comparison of applications contained in the PLC, using the ConnectPLC, UploadFromPLC, and DisconnectPLC methods described in the documentation entitled PL7 OLE Server,
- planning the execution of a list of call commands contained in a file (start the execution of a task using the date).